

Serial No. 09/507,466
Reply to Office Action dated March 16, 2004

Docket No. MEMS-0253-US

Amendments to the Claims:

This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

1. (Currently Amended) An optical device, comprising:
a substrate, the substrate adjacent to a medium, the substrate comprising:
a smooth regularly shaped exterior surface; and
an irregularly shaped exterior output surface, said irregularly shaped exterior output surface comprising:
a first optical element for directing a first portion of an incident light beam exiting the irregularly shaped exterior output surface via the first optical element in a predetermined first direction; and
a second optical element, adjacent to said first optical element on the irregularly shaped exterior surface and formed on a same side of said irregularly shaped exterior output surface as said first optical element, for directing a second portion of said incident light beam exiting the irregularly shaped exterior output surface via the second optical element in a predetermined second direction in the medium different from said predetermined first direction in the medium, the light beam exiting in the first and second directions contributing to a portion of a predetermined pattern;
wherein said first optical element is of a first shape, said second optical element is of a second shape different from said ~~second shape~~ first shape, said first and second shapes are microwedges, and said first optical element and said second optical element have non-textured and substantially planar output surfaces.

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2. (Previously Presented) The device of claim 1, wherein said first and second optical elements are transparent.
3. (Previously Presented) The device of claim 1, wherein said first and second optical elements are reflective.
4. (Cancelled)
5. (Cancelled)
6. (Original) The device of claim 1, further comprising a lens for performing a Fourier transform operation.
7. (Original) The device of claim 1, further comprising a device for optically modifying said incident light beam.
8. (Original) The device of claim 1, wherein said optical elements are arranged to split the incident light beam.
9. (Previously Presented) An optical system, comprising:
a light source for providing a light beam; and

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an optical device for homogenizing said beam, said optical device including a substrate, the substrate, the substrate adjacent to a medium, the substrate comprising:

a smooth regularly shaped exterior surface; and

an irregularly shaped exterior output surface, said irregularity shaped exterior output surface comprising, a plurality of adjacent optical elements for directing light exiting the irregularly shaped exterior output surface to form respective non-adjacent portions of an angular pattern, where at least two adjacent optical elements direct the light exiting into two different predetermined directions in the medium, the light exiting into two different predetermined directions contributing to a portion of a predetermined pattern, wherein said optical elements are microwedges formed on a same side of said irregularly shaped exterior output surface, and said microwedges have non-textured and substantially planar output surfaces and different three-dimensional configurations.

10. (Original) The system of claim 9, wherein said device is transparent.

11. (Cancelled)

12. (Previously Presented) A method of making an optical device, said method comprising the steps of:

dividing an angular pattern into a plurality of sub-angular regions;

determining micro-wedge configurations for directing light to said sub-angular regions; and

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subsequently, generating an array of micro-wedges according to said micro-wedge configurations, such that adjacent micro-wedges in said array have different configurations.

13. (Previously Presented) The method of claim 12, wherein the two-dimensional arrangement of said micro-wedges in said array is essentially random with respect to the two-dimensional arrangement of said sub-angular regions of said pattern.

14. (Previously Presented) The method of claim 13, further comprising the step of assigning said micro-wedge configurations to random locations in said array.

15. (Previously Presented) The method of claim 14, wherein said determining step includes the step of calculating output surface slopes for said micro-wedges.

16. (Previously Presented) The method of claim 15, wherein said step of generating said array includes the step of forming phase tare surfaces in said micro-wedges.

17. (Previously Presented) The method of claim 16, wherein said generating step includes the step of forming output surfaces for said micro-wedges.

18. (Previously Presented) The method of claim 12, further comprising the step of providing a plurality of tiles of said micro-wedge arrays.

19. (New) An optical device, comprising:
a substrate comprising:

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a first smoothly regular surface; and

a second surface, wherein the second surface has at least two portions, a first portion and a second portion, the first portion has a first portion surface and the second portion has a second portion surface, the first and second portion surfaces being adjacent and non-continuous, the first portion for directing a first light beam exiting the first portion in a first direction, and the second portion for directing a second light beam exiting the second portion in a second direction, the first light beam and second light beam contributing to a portion of a pattern.

20. (New) The device of claim 19, wherein the first smoothly regular surface is flat.
21. (New) The device of claim 20, wherein the first portion surface is curved.
22. (New) The device of claim 21, wherein the first portion surface is parabolic.